

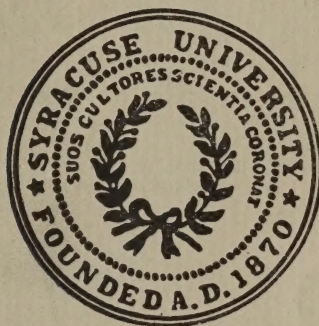
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Bulletin of Syracuse University



GRADUATE SCHOOL

APRIL, 1916

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The Graduate School OF SYRACUSE UNIVERSITY

ANNOUNCEMENT
FOR
1916-1918

SYRACUSE, NEW YORK

CALENDAR

The calendar for the Graduate School is as follows:

1916

- Jan. 5, *Wednesday*—Holiday vacation ends, a.m.
 28, *Friday*—First semester ends, p.m.
 Feb. 2-3, *Wednesday-Thursday*—Registration for all colleges.
 3, *Thursday*—Second semester begins, 8 a.m.

TUITION DUE

- 10, *Thursday*—Day of prayer for Colleges.
 22, *Tuesday*—*Washington's Birthday*.
 April 20, *Thursday*—Easter vacation begins, 8 a.m.
 27, *Thursday*—Easter vacation ends, a.m.
 May 1, *Monday*—Graduate theses due.
 18-27, *Thursday-Saturday*—Graduate oral examinations
 30, *Tuesday*—*Memorial Day*.
 June 10, *Saturday*—Annual meeting of the University Senate,
 10 a.m.
 11, *Sunday*—Baccalaureate Sermon, Gymnasium, 10.30 a.m.
 13, *Tuesday*—Annual meeting of the Trustees, 9 a.m.
 14, *Wednesday*—Commencement, 10 a.m.
 14, *Wednesday*—Chancellor's reception, 8 p.m.
 15, *Thursday*—Summer vacation begins.
 Sept. 18-19, *Monday-Tuesday*—Registration for all colleges.
 19, *Tuesday*—First semester begins in all colleges. Students
 assemble in John Crouse College Hall, 9.30 a.m.

TUITION DUE

- Nov. 7, *Tuesday*—*Election Day*.
 Nov. 29-Dec. 4, *Thanksgiving recess*—Wednesday, 6 p.m.—Monday, 8 a.m.
 Dec. 12, *Tuesday*—Mid-winter meeting of the Trustees, 9.30 a.m.
 22, *Friday*—Holiday vacation begins, 8 a.m.

1917

- Jan. 5, *Friday*—Holiday vacation ends, a.m.
 26, *Friday*—First semester ends, p.m.
 Jan. 31-Feb. 1, *Wednesday-Thursday*—Registration for all colleges.
 Feb. 1, *Thursday*—Second semester begins in all colleges, 8 a.m.

TUITION DUE

- 8, *Thursday*—Day of prayer for Colleges.
22, *Thursday*—*Washington's Birthday*.
April 5, *Thursday*—Easter vacation begins, 8 a.m.
12, *Thursday*—Easter vacation ends, a.m.
May 1, *Wednesday*—Graduate theses due.
16-25, *Thursday-Saturday*—Graduate oral examinations.
28, *Tuesday*—*Memorial Day*.
June 8, *Saturday*—Annual meeting of the University Senate,
10 a.m.
9, *Sunday*—Baccalaureate Sermon, Gymnasium, 10.30 a.m.
11, *Tuesday*—Annual meeting of the Trustees, 9 a.m.
12, *Wednesday*—Commencement, 10 a.m.
12, *Wednesday*—Chancellor's Reception, 8 p.m.
13, *Thursday*—Summer vacation begins.

FACULTY OF THE GRADUATE SCHOOL

JAMES ROSCOE DAY, S.T.D., D.C.L., LL.D., L.H.D., CHANCELLOR

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GEORGE ALBERT PARKER, MUS.D., *Professor of Organ*

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CHARLES WESLEY HARGITT, PH.D., *Professor of Zoölogy*

HENRY ALLEN PECK, PH.D., *Erastus Franklin Holden Professor of Astronomy, and Director of the Observatory*

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ADOLPH FREY, MUS.M., *Professor of Piano and History of Music*

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CHARLES WILLIAM CABEEN, PH.D., *Professor of the Romance Languages and Literatures*

JEANNETTE SCOTT, M.P., *Professor of Painting*

ISMAR JOHN PERITZ, PH.D., *Willard Ives Professor of Biblical Languages and Literature*

ERNEST NOBLE PATTEE, M.S., *Professor of Chemistry*

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JACOB RICHARD STREET, PH.D., *Professor of Pedagogy*

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JEAN MARIE RICHARDS, LITT.B., *Professor of English*

PAUL COOK NUGENT, A.M., C.E., *Professor of Civil Engineering*

ARTHUR SAYLES PATTERSON, PH.D., *Professor of French*

WILLIAM MARTIN SMALLWOOD, PH.D., *Professor of Zoölogy*

WILLIAM L. BRAY, PH.D., *Professor of Botany*

CURTIS CLARK BUSHNELL, PH.D., *Professor of Classics*

PERLEY OAKLAND PLACE, A.M., LITT.D., *Professor of Latin*

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WARREN GARDNER BULLARD, PH.D., *Professor of Mathematics*

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HENRY W. STILES, M.D., *Professor of Anatomy and Director of Anatomical Laboratory*

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ALBERT S. HURST, PH.D., *Professor of Pedagogy*

HERMON CHARLES COOPER, PH.D., *Professor of Chemistry*

ALBERT R. ACHESON, B.Sc., B.ENG., *Professor of Mechanical Engineering*

PHILIP A. PARSONS, PH.D., *Professor of Sociology*

ROBERT RICHARD TATNALL, PH.D., *Joel Dorman Steele Professor of Physics*

ROYAL A. PORTER, PH.D., *Professor of Physics*

CHARLES JULIUS KULLMER, PH.D., *Professor of German*

- WILLIAM CHARLES LOWE, PH.M., *Professor of German*
FREDERICK WILLIAM ROMAN, PH.D., *Professor of Economics*
HERBERT A. CLARK, PH.D., *Professor of Physics*
LEIGH H. PENNINGTON, PH.D., *Professor of Botany*
REGINALD STEPHEN BOEHNER, PH.D., *Professor of Chemistry*
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HAROLD LOOMIS CLEASBY, PH.D., *Associate Professor of Latin*
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ILIFF C. GARRISON, *Associate Professor of Piano and Theory of Music*
MARION S. DOOLEY, M.D., *Associate Professor of Physiology*
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BURNETT SMITH, PH.D., *Associate Professor of Geology*
ROSS JEWELL, PH.D., *Associate Professor of English*
GEORGE THOMAS HARGITT, A.M., PH.D., *Associate Professor of
Zoölogy*
HERMAN G. WEISKOTTEN, PH.B., M.D., *Associate Professor of
Pathology*
M. ELLWOOD SMITH, PH.D., *Assistant Professor of English*
ROBERT K. BREWER, A.M., M.D., *Assistant Professor of Chemistry*

REGULATIONS FOR GRADUATE WORK

HISTORY AND ORGANIZATION

Regulations governing Graduate Work, including courses of instruction, requirements for higher degrees, and the like, were revised in 1902, and the conduct of the work was placed under the supervision of a standing committee of the Faculty of the College of Liberal Arts, responsible to the Faculty. This committee was known as the Committee on Graduate Work.

In 1911-1912 the Graduate School was organized as an independent faculty consisting of a Dean and those professors and instructors of the university who give instruction in courses approved for graduate credit.

Inquiries in regard to details not afforded herein may be addressed to the Dean of the Graduate School.

ADMISSION

Admission to the Graduate School is granted: (1) to graduates of colleges and scientific schools of approved standing who present satisfactory evidences of character and qualifications, and (2) to other persons of mature age, not holding a first degree, who show earnestness of purpose and special fitness and preparation for the work they propose to pursue.

In all cases applications must be approved by the Executive Committee; and in the case of graduates of other colleges and universities, the application must be accompanied with such other information as the committee may require.

Admission to do graduate work does not imply candidacy for a higher degree.

CHARACTER OF GRADUATE WORK

The work demanded of the graduate student differs materially from that of the undergraduate. Although some of the work is specified in a minimum number of semester hours, the results of this work must be shown in ability to comprehend and to work out a specific problem in his chosen field, and in power to master it by actual contribution to the sum of human knowledge, or in data for such. Training in methods of research and practical work in investigation are afforded in departmental seminars and laboratories.

REGISTRATION

All students wishing to undertake graduate work in the Graduate School must register by filling out and filing with the Dean of the School the proper blank form of application and the card showing the courses to be taken. This registration is not complete till the application has been favorably acted upon by the Executive Committee.

RESIDENCE

A graduate student is deemed to be in residence in this University if he attends classes not less than three days each week of the College session. A minimum of one year of residence is required for a higher degree. A complete year of residence graduate work consists of not less than twenty-two semester hours, not including the work on a thesis.

*THE MASTER'S DEGREE**A. MASTER OF ARTS, MASTER OF SCIENCE.*

1. A student may be accepted as a candidate for the degree of Master of Arts or Master of Science, who has received the corresponding bachelor's degree from Syracuse University or from some other institution of approved standing.

2. Before the first of February of the year in which a student expects to obtain his degree, he must make formal application to the Dean to be placed on the list of candidates. This application must have the approval of the Executive Committee.

3. The candidate for the Master's degree shall spend at least one academic year in residence at Syracuse University before being recommended for his degree. This requirement may be met by attendance on four sessions of the Summer School.

4. The candidate must elect not less than sixteen semester hours in some one department, known as his major department, and at least six semester hours in another department, known as his minor department, and write a thesis. With the approval of the major professor four of the sixteen semester hours in the major department may be taken in another department.

The candidate's selection of courses must be approved by the Dean and the Executive Committee.

5. The candidate must pass a written examination upon such portions of his work as are not covered by his thesis. He must also pass an oral examination on his thesis and on his major and minor subjects in the presence of an Examining Committee consisting of those members of the faculty under whom he has carried on his work, with the addition of one or more members of the Faculty appointed by the Dean.

6. The oral examination may not take place later than two weeks before commencement day in any given year. It must all be taken at one time, and must be preceded by the approval of the candidate's thesis by the Examination Committee.

7. The candidate's thesis endorsed by the head of the department in which the candidate elects his major work, must be handed to the Dean on or before May 1st of the year in which the candidate presents himself for his degree.

With the permission of the Executive Committee the thesis may be written *in absentia*.

B. MASTER OF ARCHITECTURE, MASTER OF PAINTING, MASTER OF MUSIC.

A graduate in either of the courses in Architecture, Painting or Music who shall have pursued professional work for three years after graduation, may receive the Master's degree upon the following conditions: The presentation to the College of an approved original work in his particular branch of art, and examination on an approved course of reading in Esthetics and in the history of his department of art.

C. MASTER OF SCIENCE IN ENGINEERING.

Candidates for the degree of Master of Science in courses { Mechanical Engineering } must elect { Electrical Engineering }
 { A. C. III., A. C. IV., and either A. C. II., or E. L. III. }
 { M. X., S. E. VII., or M. L. III. }

They must also elect a sufficient number of hours in either Civil Engineering or { Electrical } Engineering or Physics to satisfy the { Mechanical } requirements for a first minor. The particular courses to be so elected will depend upon the previous training of the candidate and must be approved by the heads of the departments concerned. A second minor must be chosen and a satisfactory thesis presented.

D. MASTER OF PEDAGOGY.

Candidates shall (a) hold a bachelor degree; (b) be in residence at the University for a period of at least one year; (c) successfully complete 20 hours of classroom work; (d) write an approved thesis; (e) pass satisfactory examinations both written and oral; (f) have at least one year of successful experience as a teacher.

THE DOCTOR'S DEGREE

A. DOCTOR OF PHILOSOPHY.

1. A student may be accepted as a candidate for the degree of Doctor of Philosophy who has received the degree of Bachelor of Arts, Bachelor of Science, or Bachelor of Philosophy, or its equivalent, from

Syracuse University or from some other institution of approved standing. Also all candidates shall have a reading knowledge of two modern languages besides English.

2. Not later than December 15th in his final year of preparation for the degree, the student will file with the Dean a formal application to be placed on the list of candidates, stating the topic of his thesis. No candidate may present himself for final examination until this application has been approved by the Executive Committee.

3. The candidate for the degree of Doctor of Philosophy shall spend at least three academic years in residence. Not more than two years of residence work in another approved institution may be offered by the student; but the credit given for such work is given for time of residence only, and does not exempt the student from any part of the examination on his subjects. The last year of study must be spent at Syracuse University, and may not be taken in the Summer School.

The University does not obligate itself to confer the degree at the expiration of any specified time, since quality of work and mastery of methods of investigation will have primary consideration.

If the candidate has already received his Master's degree at Syracuse University, the residence and study accepted in fulfilment of the requirement of that degree may be counted in partial fulfilment of the requirement for the degree of Doctor of Philosophy, provided such residence and study be approved by the Faculty as suitable to be so counted.

4. The candidate must elect a major subject to which he must devote not less than thirty-six semester hours, and first and second minor subjects to which he must devote not less than twelve semester hours each. The first minor subject may be chosen from the same group as the major subject, but it must not be chosen from the same department. The second minor subject may be chosen in any department approved by the Major Professor and Dean.

See also last paragraph of 4 under THE MASTER'S DEGREE.

The power of independent research must be unquestionably shown by the production of a thesis on some topic connected with the major subject of study.

5. The candidate must pass a written examination upon such portions of his work as are not covered by his thesis. He must also pass an oral examination on his thesis and his major and minor subjects in the presence of an Examining Committee consisting of those members of the Faculty under whom he has carried on his work, one or more members of the Faculty appointed by the DEAN and any other members of the Faculty who may desire to be present.

6. Previous to the Final Oral examination the candidate must pass a

Preliminary examination, oral, or written, or both, covering the matter included in both major and minors up to the time it is taken, which may not be earlier than one year prior to the date contemplated for receiving the degree nor later than the middle of the final year of the course. Until such examination is satisfactorily passed the candidate may not be enrolled for the degree. When such examination is deemed unsatisfactory the applicant may, by permission of the Executive Committee, be granted a second trial, but only after a period of one semester.

The Final oral examination may not take place later than two weeks before commencement day in any given year. It must all be taken at one time, and must be preceded by the approval of the candidate's thesis by the Examining Committee.

7. The candidate's thesis, endorsed by the head of the department in which the candidate elects his major work, must be handed to the Dean on or before May first of the year in which the candidate presents himself for his degree.

The thesis must constitute a definite contribution to knowledge in the field in which it lies, and must be founded on the original investigations of the writer. As such it will follow that the thesis, more than any other part of the student's work, will be deemed an index of his scholarly qualities, and will largely condition his final promotion to the Doctorate in Philosophy.

The Executive Committee shall have the right to challenge any thesis. Any member of the Faculty shall have the privilege of examining the thesis.

In case the thesis is accepted, the candidate must print it and deposit at least one hundred copies with the librarian of the University.

B. DOCTOR OF PEDAGOGY.

Candidates shall (a) hold the bachelor's degree; (b) be in residence at the University for at least two years; (c) successfully complete 40 hours of classroom study; (d) submit an approved thesis showing original research work; (e) pass satisfactory examinations both written and oral; (f) have at least three years of successful experience as a teacher.

LIBRARIES

The various libraries of the University comprise 99,000 volumes.

The General Library contains 86,000 volumes and over 41,000 pamphlets. The periodical room is supplied with the chief periodicals, American and foreign.

The most valuable special collection in the General Library is the historical library of Leopold von Ranke, given to the University by Mr. and Mrs. John M. Reid. It includes many rare books and documents and is of great value for research work.

The several departmental libraries are the Belden Library of Economics, the Peck alcove and the libraries of the Classical, History, German, English, Sociology, Biology, Chemistry and Mathematics departments.

The library at the College of Medicine contains more than 9,000 bound volumes and a large number of pamphlets and unbound periodicals.

The forest library of The New York State College of Forestry is the best of its kind in the state.

The Colleges of Law, Applied Science and Agriculture each have special libraries conveniently situated for their work.

The students of the University have the privilege of using the Syracuse Public Library and the library of the Court of Appeals of the State of New York, one of the best law libraries in the country.

MUSEUMS

The University Museums contain material for illustrating the subjects of Geology, Mineralogy, Zoölogy, Botany, Chemistry and Archaeology.

FEES

Matriculation	\$ 5.00
Tuition, a semester,	
Single Course	12.50
Four or more Courses	50.00
Graduation and Diploma	20.00

Students pay a fee of two dollars for each semester hour taken in excess of sixteen hours.

In case payment is not made within two weeks of the time it is due, the student is automatically suspended.

All bills are payable at the offices of the Treasurer in the Administration Building. Checks should be drawn payable to Syracuse University.

REFUND OF TUITION

No fees for instruction will be refunded except in cases of sickness. If on account of serious illness a student withdraws before the middle of a semester, one-half of his tuition fee will be refunded, provided he secures from the Dean a statement of honorable standing, and from the University physician a certificate that his health will not permit him to remain in attendance.

DORMITORIES

An advance deposit of \$10.00 must be paid by each student when room is engaged or reserved. This payment will be credited upon the first term's bill and will be refunded in case the student does not become or remain a student in the University, provided the room is given up before September 1st.

All remaining payments for rooms and board are payable quarterly in advance, as follows: (1) at the beginning of the college year, (2) the first day after Thanksgiving recess, (3) at the beginning of the second semester, (4) the first day after the Easter vacation.

For circular of information and diagrams of dormitories, address the Treasurer of the University.

Students may re-engage rooms occupied by them for the following year provided that applications are made prior to April 1st, but such rooms will not be held longer than May 15th, unless contracts are signed and deposits paid by that date.

Furniture and bed linen are supplied by the University; students must supply their own towels.

For Men: Board and room in Sims Hall varies from \$215 to \$250 a year, including heat and light according to location of rooms.

For Women: Winchell Hall has rooms with or without bath; Haven Hall, especially for the Fine Arts students, has single rooms or suites with practice pianos; Reid Hall accommodates 34; Vernon Cottage accommodates 20; Parker, McChesney, Schultze, Wilbor, Annable, Clarke and Babcock Cottages have rooms for about 15 each. Prices for board and room vary from \$200 to \$350 a year.

Women students of the University not in dormitories or chapter houses may live only in those boarding houses approved by the University, a list of which will be sent on request from the Registrar's office.

COURSES OF INSTRUCTION

Courses are offered in the following groups of subjects:

- I. Languages and Literatures.
- II. Philosophy, History, Social Sciences.
- III. Physical and Natural Sciences, Mathematics.
- IV. Medical Sciences.
- V. Fine Arts.
- VI. Engineering.
- VII. Education.

NOTE.—A numeral following the number of the course indicates the number of exercises a week. All courses extend through the year unless followed by a Roman numeral which limits the subject to the semester named. In the designation of rooms the Hall of Languages is meant unless otherwise indicated.

GROUP I

BIBLICAL LANGUAGES AND LITERATURE

PROFESSOR PERITZ

Courses I, III, V and VI are for undergraduate and graduate students.

Courses II, VII and VIII are for graduate students but may be taken by competent seniors.

LINGUISTIC COURSES

I. 3. HEBREW. ELEMENTARY COURSE. Including the grammatical principles of the language, the reading of easy Hebrew prose, the acquisition of a vocabulary, and translation of English into Hebrew. *T. Th. S., 8.50.*

II. 3. HEBREW. ADVANCED COURSE. First semester, rapid and extensive reading; second semester, critical study of portions of the Old Testament. Hours to be arranged.

III. 2. GREEK TESTAMENT AND SEPTUAGINT. Some attention is given to the philological characteristics of Hellenistic Greek; but chief emphasis is placed upon the critical and exegetical problems of New Testament study. The Septuagint receives attention in connection with the quotations from the Old Testament. *T. Th., 12.*

Courses in Aramaic, Assyrian, and Arabic will be given as they may be required by students prepared for them.

BIBLICAL COURSES—(English Bible)

(These courses do not require a knowledge of the original languages.)

V. 3. **BIBLICAL LITERATURE.** The contents of the Old Testament (first semester) and of the New Testament (second semester) are studied in their chronological order, with view to their historical origin, literary character, and religious and moral teachings. *T. Th., II.*

Open to juniors and seniors who have had course IV or its equivalent.

VI. 1. **BIBLICAL ARCHAEOLOGY.** A course dealing with the texts and versions of the Bible, particularly the English Version; the geography of Bible land, with special attention to recent discoveries. This course is illustrated with stereopticon views. Lectures and collateral reading. *W., II.*

Open to those who have taken or are taking course IV.

VII. 3. **THE TEACHINGS OF THE BIBLE.** This course traces the essential religious, ethical, and social ideas of the Bible through their various stages of growth to their culmination. The method pursued is the historical; and it presupposes the results of biblical criticism. Lectures and collateral reading. *W., 2-4.*

Open to those who have had courses IV and V or their equivalents.

VIII. **SEMINAR.** For seniors and graduates. Research, reports, and theses.

GREEK

PROFESSOR EMENS, ASSOCIATE PROFESSOR DAVEY

Courses IV and V, VI and VII alternate.

Courses IV-XIV are for advanced undergraduate students, and with additional requirements, may be taken as graduate courses for the master's degree.

Courses IX and X are open to all students.

Courses XV-XVII are for graduate students only. Graduate courses will be arranged when required. Graduate students should have a reading knowledge of German.

IV. 2. **GREEK HISTORY.** A study of Greek History from its sources. Each student investigates some special topic critically. Lectures and translations in the class give a general view of the period. Associate Professor Davey. Not given in 1916-1917.

V. 2. **PLATO.** Select Dialogues. A study is made of Plato together with the literary and political views of his time. *Th. S., 10.* Associate Professor Davey.

VI. 2. (1) **PINDAR.** The Olympian and Pythian Odes with some poems of Bacchylides. (2) **ARISTOPHANES.** Select Plays. Special

attention is given to the history of Comedy, and to the public and private life of the Greeks as illustrated by Aristophanes. Lectures and reports. *T. Th., 10.* Professor Emens.

VII. 2. GREEK TRAGEDY. Representative plays are read from Æschylus, Sophocles, and Euripides. Lectures are given on the history of Greek tragedy and on scenic antiquities, illustrated by photographs and lantern slides. *T. Th., 10.* Professor Emens.

VIII. 1. PROSE COMPOSITION. This course is intended especially for those who propose to teach. A systematic study is made of the constructions and idioms of the language. The work is done in connection with different authors for the comparison of their style. *F., 12.* Professor Emens.

IX. 1. GREEK LITERATURE IN ENGLISH. A study of the history of Greek literature and an interpretation through translations of some of the choicest selections. Especial attention will be given to the Greek drama. Lectures, readings and reports. *W., 11.* Associate Professor Davey.

X. 2. GREEK EPIC IN ENGLISH. Reading and study, in the best translations, of the Iliad and Odyssey. The influence of Greek Epic, and the characteristics of epic literature in general, will be made clear by a survey of the numerous non-Greek epics. In this part of the course, especial attention will be given to the Latin, Italian, German, French, Portuguese, English, Hindu and Persian epics. Lectures, readings and reports. *M. F., 11.* Associate Professor Davey.

XI. 1. GREEK CIVILIZATION. This course will present in English, so far as the time allows, the cultural contributions of the Ancient Greeks. It will be of a varied nature, architectural, sculptural, historical and literary. The instruction will be given by means of illustrated lectures, text-book and collateral reading.

XII. 1. TOPOGRAPHY AND ANTIQUITIES OF GREECE. A course of lectures illustrated by photographs and lantern slides, on Athens, Eleusis, Troja, Tiryns, Mycenæ, Argos, Olympia, Delphi and Corinth. Student reports. *S., 10.* Professor Emens.

XIII. 1. HOMER'S ILIAD AND ODYSSEY. The purpose of this course is to read a large amount of Greek with accuracy and ease and also to gain a first-hand knowledge of these great epics. The Odyssey will be read in 1916-1917. *T., 10.* Associate Professor Davey.

XIV. 1. EURIPIDES. *Lucian.* The aim of this course is the same as that of course XIII. Selected plays of Euripides and dialogues of Lucian are read rapidly. Professor Emens.

XV. 1. GREEK GRAMMAR. This course will treat by lectures the history of Greek Syntax and the fundamental principles of the cases, modes and tenses. *F., 8.50.* Professor Emens.

XVI. 1. GREEK EPIGRAPHY. Especial attention will be given to historical inscriptions. *F.*, 8.50. Professor Emens.

XVII. 2. GREEK SEMINAR. The object of the Seminar is to afford training in text-criticism and interpretation of Greek authors, and in research. The subject offered for 1915-1916 is *The Tragedies of Sophocles and Scenic Antiquities*. *W.*, 3-5 p.m. Professor Emens.

LATIN

PROFESSORS SMALLEY, BUSHNELL, PLACE, ASSOCIATE PROFESSOR CLEASBY.

Of the elective courses, III, IV, V, VI, VII, IX, X, XI, XIIIa, XIIIb, XIV, XV, XVI, XVII, XX, XXIV, XXVI and XXVII may be taken by undergraduate and graduate students.

Courses VIII, XII, XVIII, XIX, XXI, XXII, XXIII and XXV are primarily for graduate students.

Courses VI and VII, IX and X, XIIIa and XIIIb, XX and XXIV, XXVI and XXVII, alternate.

III. 3. (1) PLINY: Selected Letters, or CICERO: Tusculan Disputations. (2) Roman Poetry, chiefly Catullus, Lucretius and Tibullus; (3) HORACE: Odes and Epodes; With each author lectures and assigned reading. *M. W. F.*, *Sec. A.*, 8.50, 210; *Sec. B.*, 2, *M. W. F.*, 301; *Sec. C.*, 11, *M. W. F.*, 210. Professor Place, Associate Professor Cleasby, Assistant Professor Warner.

IV. 3. ROMAN COMEDY. Plautus and Terence:—I. *M. W. F.*, 8, room 210. Professor Smalley.

V. 3. METHODS IN LATIN. Includes an examination of the aim and province of classical studies, the methods of preparatory schools, preparatory course, pronunciation of Latin, preparation of papers, illustrative and sight reading from Cæsar, Cicero, Vergil or Livy.—II. *M. W. F.*, 8, room 210. Professor Smalley.

Courses IV and V are required of major students, preferably in the senior year. Either may be elected by others as a half-year course. All desiring a recommendation to teach Latin must take course V.

VI. 3. TACITUS: Selections from the Annals and Histories. Roman society and literature of the Empire; lectures and assigned reading; selected passages from Tacitus' contemporaries; brief special reports on assigned topics. *T. Th. S.*, 850, room 210. Professor Place.

VII. 3. LETTERS OF CICERO. A large number of letters will be read showing Cicero's character, tastes, and relations to his personal and literary friends. Study of his public life. Lectures. Papers. *T. Th. S.*, 8.50, 210. Professor Place.

Not given in 1916-1917.

VIII. 2. LETTERS OF THE YOUNGER PLINY. Especial references to Roman social life and thought in Pliny's time.—II *T. Th.*, 12, *Seminar room*. Professor Place.

IX. 2. LATIN LITERATURE AND ITS RELATIONSHIPS. Survey of the Indo-European literatures. The place of the Latin literature among the others, especially in relation to the Greek and the English. Survey of the Latin literature from Ennius to Cicero by means of illustrative selections. *T. Th.*, 12, *Seminar room*. Professor Bushnell.

Not given in 1915-1916.

X. 2. LATIN LITERATURE AND ITS RELATIONSHIPS. Continuing IX and of a similar scope. Illustrative selections from Cicero to Augustine. *T. Th.*, 12, *Seminar room*. Professor Bushnell.

XI. 1. LATIN COMPOSITION. Somewhat elementary. *T.*, 2 *p.m.*, *room 210*. Associate Professor Cleasby.

XII. 1. LATIN WRITING. More advanced than course XI. Designed for students who expect to teach Latin. *S.*, 12, *room 210*. Professor Place.

XIIIa. 3. VERGIL. The *Æneid*, Books VII-XII and parts of I-VI. Critical study of portions of the *Æneid*, its literary merits, ethical and religious ideas. Readings from the *Eclogues* and *Georgics* with lectures on the development of *Epic* poetry and *Vergil's* literary relationships. *T. Th. S.*, 11, *room 210*. Professor Place.

XIIIb. 3. LUCRETIVUS (I), JUVENAL AND MARTIAL (II). A critical study of the literary merits of these authors and their relations to their times. *T. Th.*, 3, 11, *210*. Professor Place. Not given in 1916-1917.

XVI. 1. LATIN EPIGRAPHY. An introduction to the study of Inscriptions and to the *Corpus* which will be available for use in the Classical Seminar room. Includes also the non-literary, non-linguistic side of Latin, and the present-day attitude with reference to much important material.—I. *Th.*, 2 *p.m.*, *Seminar room*. Professor Bushnell.

XVII. 1. LATIN PALEOGRAPHY.—II. *Th.*, 2 *p.m.*, *Seminar room*. Professor Bushnell.

XVIII. 3. LATIN EPIGRAPHY. An advanced course.—I. Professor Bushnell.

XIX. 3. LATIN PALEOGRAPHY. An advanced course.—II. Professor Bushnell.

XX. 2. TOPOGRAPHY AND MONUMENTS OF ANCIENT ROME. Lectures, assigned reading, recitations, and thesis; especial attention will be paid to the testimony of classical writers on this subject. *T. Th.*, 8, *room 209*. Associate Professor Cleasby. Not given in 1916-1917.

XXI. 2. HISTORICAL LATIN GRAMMAR. Development of the verb-

stem and inflections. Selected readings from the grammarians. Lindsay's *The Latin Language*, Stolz's *Lateinsche Grammatik*, Lane's *Latin Grammar*, Kiel's *Latini Grammatici* (vols. I, II, and V). Professor Place.

XXII. THESIS. Critical study, research, thesis. The field may be either philological, archaeological, literary or historical. *Classical Seminar room*.

XXIII. 1. PRO-SEMINAR. For graduate students. The purpose is to introduce the students to methods of research. The work will be in the fields of history, private life, textual and literary criticism, and will be directed in turn by four members of the department. *M., 2, Library*.

XXIV. 2. PUBLIC AND PRIVATE ANTIQUITIES OF THE ROMANS. Lectures, assigned reading, recitations, theses. The subject will be correlated as far as possible with Roman history and literature. *T. Th., 8, room 209*. Associate Professor Cleasby.

XXV. 1. CHRISTIAN LATIN. The Church Fathers. Documents bearing on Church History. Lives of saints. The Hymns. *Th., 2 p.m., Seminar room*. Professor Bushnell.

XXVI. 2. ROMAN ELEGY. Selections from Catullus, Tibullus, Propertius, and Ovid. Development of the elegy and the literary relationships of these poets. *T. Th., 10, room 210*. Assistant Professor Warner.

Not given in 1916-1917.

XXVII. 2. THE ECLOGUES AND GEORGICS OF VERGIL. A careful study of the ten Eclogues and the four Georgics, their literary merits and relationships. Development of pastoral and didactic poetry. Collateral reading and reports. *T. Th., 10, 210*. Assistant Professor Warner.

GERMANIC LANGUAGES AND LITERATURES

PROFESSORS HOLZWARTH, KULLMER AND LOWE.

Courses VI, VII, VIII, IX, X, XIV, XVIII, XIX, XX and XXI may be taken by undergraduate and graduate students.

Courses XV, XVI, XVII and XXII are primarily for graduate students.

VI. 3. GERMAN LITERATURE FROM THE BEGINNINGS TO THE REFORMATION. Early and Medieval Germanic civilization and customs. Germanic mythology and Heldensage. Medieval court epics and minnesongs. Lectures in German and Collateral reading. *M. W. F., 8.50, room 105*. Professor Howe.

VII. 3. LESSING AND HIS CONTEMPORARIES. Representative works of this period will be studied and special emphasis will be placed upon the influence of Lessing upon the German drama. *M. W. F., 10, room 205*. Associate Professor Gorse.

VIII. 3. GOETHE'S LIFE AND WORKS. Together with an outline study of Goethe's life, his works are treated in the order of his development. Practice in reading and writing German. Collateral reading. *M. W. F.*, 8.50, room 205. Professor Holzwarth.

This course is conducted mainly in German.

IX. 3. SCHILLER'S LIFE AND WORKS. This course is conducted after the manner of course VIII. Schiller's character and influence as a writer and thinker will be considered and his best plays, poems and prose writings will be read. Lectures and collateral reading. *T. Th. S.*, 8.50, room 105. Professor Lowe.

X. 2. GERMAN LITERATURE FROM 1848 TO THE PRESENT. This course will consist of lectures in German and assigned readings. The short-story writers of the period including the women writers. The realistic school with a careful treatment of the lives and works of Sudermann and Hauptmann. *M. F.*, 11, room 110. Associate Professor Gorse.

XIV. 2. SEMINAR. The development of the German Drama.—I. German Lyrics.—II. This course is intended for major students. *Th.*, 3 p.m. *German Seminar Room*. Professor Holzwarth.

XV. 2. MIDDLE HIGH GERMAN. König Rother, *Kudrun*, Hartmann von Aue, Walther von der Vogelweide and prose writers of the twelfth and thirteenth centuries will be read.—II. *M. F.*, 10, *German Seminar room*. Professor Holzwarth. Designed to furnish a foundation for the historical study of German.

XVI. 2. OLD HIGH GERMAN. This with course XV forms a natural sequence to XVII. Braune, *Althochdeutsche Grammatik* and *Althochdeutsches Lesebuch*. Lectures on the literature and development of the German language. *M. F.*, 2, room 205. Professor Holzwarth.

XVII. 2. GOTHIC. Wright, *Gothic Grammar*, Streitberg, *Gotisches Elementarbuch*, Ulfilas.—I. *M. F.*, 10, room 203. Professor Holzwarth.

This course is offered to those who intend to study German or English historically.

XVIII. 2. CRITICAL PROSE. Historical, philosophical, economic and journalistic German, largely concerning Germany. *T. S.*, 12, room 205. Professor Kullmer.

This course is conducted partly in German.

XIX. 2. GERMAN LITERATURE FROM ABOUT 1800 TO 1848. Lectures in German and assigned reading. Romanticism in Germany. Life and works of Heinrich Heine. Special attention to the patriotic and lyric poetry of this period. *T. Th.*, 11, room 105. Professor Lowe.

XX. 2. ADVANCED COMPOSITION AND CONVERSATION. Continuation of course XII. The course will afford practice in speaking and writing idiomatic German. Original themes. Recitations and conferences. *T. Th.*, 8.50, room 205. Professor Holzwarth.

Open to students who have had course XII, and to others on consultation with the instructor.

XXI. 3. OUTLINE HISTORY OF GERMAN LITERATURE. Viewed broadly as the reflex of German civilization. Lectures, themes, and class-room exercises. Classic work characteristic of the periods under discussion will be read. Especial emphasis will be laid on lyric poetry. *T. Th. S., II, room 205.* Professor Kullmer.

XXII. 2. HISTORY OF THE GERMAN LANGUAGE. An introduction to the study of Germanic Philology and the history of the German language. Lectures and reading of selected texts. *T. Th., II. German Seminar room.* Professor Holzwarth.

ROMANCE LANGUAGES AND LITERATURES

PROFESSORS CABEEN, PATTERSON

FRENCH

LITERATURE COURSES

Courses VII, VIII, IX, XII, XIII, XV, XVI, XVII, XXI, XXIV are for undergraduate and graduate students.

VII. SIXTEENTH CENTURY LITERATURE. Marot, the Pléiade, Montaigne, Rabelais. Transition to the Seventeenth Century. Lectures, reports, interpretation of texts. *M. W. F., II.* Professor Cabeen.

VIII. SEVENTEENTH CENTURY LITERATURE. A more extended study of the great dramatists than that offered in Course XIX. Corneille, Molière, Racine, together with La Fontaine and Boileau. *M. W. F., IO.* Professor Cabeen.

IX. 2. SEVENTEENTH CENTURY LITERATURE. The great prose writers: Descartes, Pascal, La Bruyère, La Rochefoucauld, Madame de Sévigné, St. Simon. *T. Th., IO.* Professor Cabeen.

XII. 3. EIGHTEENTH CENTURY LITERATURE. Selections from Voltaire's philosophical and historical works and from his dramas.—I. *M. W. F., II.* Extracts from Rousseau, together with representative chapters from his *Nouvelle Héloïse*.—II. *M. W. F., II.* Professor Cabeen. Not given in 1916-1917.

XIII. 2. EIGHTEENTH CENTURY LITERATURE. Montesquieu and Diderot.—I. *T. Th., II.* Marivaux, Le Sage, Beaumarchais.—*T. Th., II.* Professor Cabeen. Not given in 1916-1917.

XV. 3. NINETEENTH CENTURY LITERATURE. The prose and poetry of Victor Hugo. *M. W. F., IO.* Professor Cabeen.

XVI. 2. NINETEENTH CENTURY LITERATURE. The works of Honoré de Balzac. *T. Th., IO.* Professor Cabeen.

XVII. 2. MODERN FRENCH POETRY. Selected masterpieces are read

to show the structure and spirit of French lyric poetry. *M. W.*, 8.50. Professor Patterson.

XXI. 2. OLD FRENCH AND HISTORY OF THE FRENCH LANGUAGE. This course will begin with the earliest period of the language and will conclude with a study of the phonetics of Modern French. Bourciez' *Phonétique Française* and Gaston Paris' *Extraits de la Chanson de Roland* are among the texts used. Professor Patterson.

XXIV. 1. SEMINAR. The work done is based upon the courses offered in any given year. Professor Cabeen.

FRENCH PRIZE. A prize of \$25, known as the Eugene Petit Prize, has been established in memory of their father by Messrs. Douglas E. Petit of Syracuse, and Louis J. Petit of Milwaukee, Wis. This prize is offered for the best thesis on an assigned subject in French literature.

SPANISH

Courses III, IV and V may be taken by undergraduate and graduate students.

V. 2. CONVERSATION AND COMPOSITION. Practice in colloquial Spanish, commercial forms, and letter writing. Open to students who have taken Spanish I. *T. Th.*, 12. Professor Patterson.

IV. 3. MODERN SPANISH NOVELISTS. Representative works of Ibáñez, Valdés, Galdós, Valera, Alarcón, etc., will be read and discussed in Spanish. Kelly's *History of Spanish Literature* will be the text for reference. Professor Patterson.

III. 3. SPANISH CLASSICS. Cervantes' "Don Quixote and selected masterpieces of Lope de Vega and Calderón will be read. Professor Cabeen.

ITALIAN

Course III may be taken by undergraduate and graduate students.

III. 3. DANTE LA DIVINA COMMEDIA AND LA VITA NUOVA, with rapid consideration of his other works. Professor Cabeen.

ENGLISH

PROFESSORS MORRIS, RICHARDS, AND EATON, ASSOCIATE PROFESSORS CARTER, BAEBENROTH, AND JEWELL, ASSISTANT PROFESSOR SMITH

The following courses are open to Graduate Students conditionally: II, VI, VII, XI, XII, XIII, XVI, XVIII, XXI, XXIII. The following are open to Graduate Students who have not covered the same field as undergraduates: IV, V, IX, X, XIV, XV, XIX, XX, XXVI.

Students desiring to make a graduate major in English should have the equivalent of Courses II or XXI, and IV or VI, and at least two courses in general literature.

COMPOSITION COURSES

II. 2. ENGLISH COMPOSITION. Exposition, Description, and Narration. Themes of two kinds, daily themes and long themes; lectures and conferences. *T. Th., 10, room 310.* Professor Richards.

Open to a limited number of juniors and seniors who have passed in course III or XXII, or have attained high grade in course I.

XXI. 2. ENGLISH COMPOSITION. Exposition and Argument. Expositions, orations, briefs and arguments. *M. W., 8.50, room 213.* Professor Morris.

Open to juniors and seniors who have passed in III or XXII, or who have attained high grade in I.

XXIII. 2. ENGLISH COMPOSITION. Play-writing; the technique of modern drama, and practice in construction of plays. *T. Th., 8.50, room 310.* Professor Morris.

Open to a limited number of juniors and seniors who have attained high efficiency in composition.

LANGUAGE COURSES

IV. 3. ANGLO-SAXON. Bright's *Anglo-Saxon Reader*.—I. *M. W. F., 10, room 310.* Instructor Bradford.

V. 3. ANGLO-SAXON POETRY. Wyatt's *Béowulf*; Zupitza's *Elene*. Lectures on the literature.—II. *M. W. F., 10.* Instructor Bradford.

XIX. 1. MIDDLE ENGLISH. Study of specimens of Early English; collateral readings and reports; lectures on the history and development of the language. Associate Professor Baebenroth.

Open to seniors by special permission.

LITERATURE COURSES

VI. 3. CHAUCER. A number of the *Canterbury Tales* and other poems are read with special attention to the language and sources, to the customs of the times and to the life of the writer, concluding with a brief study of the development of the English language. *T. Th. S., 11, room 310.* Associate Professor Carter.

VII. 3. SHAKESPEARE. Five or six plays are read. Similar in method to course VI. *M. W. F., 11, room 310.* Professor Morris.

IX. 4. ENGLISH LITERATURE. Elizabethan drama, with special study of Shakespeare. Lectures and reports.—I. *M. W. F., 12, room 310.* Assistant Professor Smith.

Open to those who take or have taken course VI or course VII.

X. 4. ENGLISH LITERATURE. From Wyatt to Milton, exclusive of the drama. Lectures and reports.—I. *T. Th. S., 8.50, room 310.* Assistant Professor Smith.

Not given in 1916-1917.

XI. 3. ENGLISH LITERATURE. From Dryden to Burke. Lectures and reports.—II. *T. Th. S.*, 10, room 207. Associate Professor Jewell.

XII. 2. ENGLISH LITERATURE. From Burns to the death of Scott. Lectures and Reports. *W. F.*, 10, room 310. Associate Professor Carter.

XIII. 3. ENGLISH LITERATURE. From Macaulay to Stevenson. Lectures and reports. *M. W. F.*, 8.50, room 310. Professor Eaton.

XIV. 3. ENGLISH LITERATURE. Tennyson. Lectures and reports.—II. *T. Th. S.*, 8.50, room 310. Assistant Professor Smith.

XV. 3. ENGLISH LITERATURE. Browning. Lectures and reports.—II. *T. Th. S.*, 8.50, room 310. Assistant Professor Smith.

Not given in 1915-1916.

XVIII. 3. ENGLISH LITERATURE. Modern drama in English. Lectures and reports. *W. F.*, 12, room 310. Professor Richards.

XX. SEMINAR. For seniors and graduates. Research, reports and theses.

XXVI. 2. ENGLISH LITERATURE. Wordsworth. Lectures and class thesis.—II. *T.*, 3. Associate Professor Baebenroth.

RHETORIC AND PUBLIC SPEAKING

PROFESSOR TILROE

V. 1. ADVANCED PUBLIC ADDRESS. Designed for the senior year. Original orations. Hymn and Bible reading. Platform etiquette. *W.*, 12. Professor Tilroe.

Open to men who have completed course IV.

VI. 2. ORAL DEBATE. The purpose of this course is to qualify the student for all ordinary parliamentary occasions by a study of the theory and practice of debate. Lectures, Class-room debates, individual criticisms.—I. Rhetoric or Oratory. The purpose of this course is to qualify the student to deliver an address on any occasion. Lectures, speeches, individual criticisms, conferences.—II. *T. Th.*, Sec. A., 12; Sec. B., 2. Library. Assistant Professor Kennedy.

Open to men who have completed course IV or English XXI and to others by special permission.

VII. 1. ADVANCED DRAMATIC READING. Original adaptations from standard literature. Two plays of Shakespeare are studied from the standpoint of dramatic interpretation. Conferences. Open to men and women who have shown ability in course II. *Th.*, 10. Professor Tilroe.

May be taken two successive years.

VIII. 2. ADVANCED DEBATE. The purpose of this course is to qualify the student to act as debate coach or teacher of debating and to deliver a finished argument. Specially suited to the needs of school

principals, lawyers, ministers and the like. Special attention given to the fallacies of argument. A few live questions will be studied intensively. Lectures, reports, class-room debates, individual criticisms, conferences. Library, Debate Union room. Hours to suit students and instructors. Assistant Professor Kennedy.

Open to men who have completed course VI and to intercollegiate debaters.

GROUP II

HISTORY

PROFESSORS MACE, FLICK, SPERRY, ASSOCIATE PROFESSOR TANNER,

Courses II, III, V, VI, VII, VIII, IX, X, XIV, XV, XVI, XVIII and XXII may be taken with additional requirements by graduate students.

EUROPEAN HISTORY

II. 3. THE MEDIEVAL CHURCH. A study of the old church, as the determining factor in European civilization, from its beginnings in the first century to its zenith of power in the thirteenth century. Text-book, readings, reports and study of sources. For juniors and seniors. —I. *M. W. F., 10, room 307.* Professor Flick.

III. 3. THE PROTESTANT REVOLUTION. A consideration of those forces which weakened the old church and produced a general revolution that resulted in the rise of the various Protestant churches. Lectures, readings, reports and study of sources. For juniors and seniors. —II. *M. W. F., 10, room 307.* Professor Flick.

IV. 3. THE MODERN CHURCH. The history of the Christian church, in its manifold activities and changes, from the Thirty Years' War to the present time. Lectures, readings, reports and study of sources. For graduates. *M. W. F., 11, room 307.* Professor Flick.

V. 2. THE FRENCH REVOLUTION AND NAPOLEONIC ERA. 1789-1815. After an intensive analysis of the European causes and antecedents of the French Revolution, a careful study of the progress of that great movement will be made. Then the rise of Napoleon will be considered and the general results of the period discussed. Lectures, text-books, sources and reports. For juniors and seniors. *T. Th., 12, room 307.* Professor Flick.

VI. 2. RECENT EUROPEAN HISTORY. 1815-1915. This course is planned to connect Europe of the past with Europe of today. While stress will be laid upon the series of revolutionary waves by which political liberty and social emancipation have been largely secured, at the same time progress along educational, religious and industrial lines

will be explained. Lectures, text-book, readings and reports. For juniors and seniors. *M. W.*, 12, room 307. Professor Flick.

XV. 2. HISTORY OF EUROPEAN CULTURE. In this course the cultural contributions of the ancient world to the modern will first be considered. Then medieval culture will be traced along its various lines of development to the Renaissance. An intensive study of the Renaissance will be made and its results carefully noted. Special emphasis will be laid on the history of art. Lectures and readings. *T. Th.*, 11, room 307. Assistant Professor Lauber.

XVIII. 1. SEMINAR IN EUROPEAN HISTORY. During 1915-1916 the most important sources of the French Revolution will be studied. Limited to students reading the French language. Professor Flick.

ENGLISH HISTORY

VII. 3. ENGLISH HISTORY. From 1500 to the present time. Traces the leading developments in English institutions since 1500, giving particular emphasis to political changes as an aid to the study of the English and American constitutions. Cross, *History of England and Greater Britain* and Marriotte, *English Government* are used. Lectures, recitations, readings and reports. Open to juniors and seniors. *M. W. F.*, Sec. A., 8.50, room 305, for men only; Sec. B., 11, room 307, for women only. Professor Sperry.

AMERICAN HISTORY

VIII. 3. AMERICAN HISTORY. Includes the study of colonial institutions, the Revolution, the origin and interpretation of the constitution, the growth of nationality and its struggle with democracy and slavery. Lectures, readings and the study of documents. Open to seniors, and juniors by special permission. *M. W. F.*, 8.50, room 307. Professor Mace.

X. 2. METHOD IN HISTORY. A study of the organization of historical material and of its adaptation to the different phases of the mind's development. Students must present equivalent of a minor. Required of students who expect to teach history. *T. Th.*, 8, room 307. Professor Mace.

XI. 1. METHOD OF HISTORICAL INVESTIGATION. Required of juniors who select history as a major. *W.*, 4-6 p.m., room 305. Professor Flick and Associate Professor Tanner.

XIII. 3. SEMINAR FOR GRADUATE STUDENTS. All graduate students taking their major work in the department of History meet weekly for consultation and discussion. *S.*, 11-1. Professor Mace, Associate Professor Tanner.

XX. 2. THE CIVIL WAR AND THE RECONSTRUCTION. An intensive

study of the Civil War and the reestablishment of the Union with special reference to political and constitutional questions. Graduates and specially qualified seniors. Associate Professor Tanner.

Not given in 1916-1917.

XXIII. 2. RECENT AMERICAN HISTORY. A study of the period from the end of Reconstruction to 1912. This course will stress political development, but some effort will be made to trace the progress of the United States in other fields. Open to seniors. *T. F.*, 2 p.m. Associate Professor Tanner.

ANCIENT AND ORIENTAL HISTORY

XVI. 2. ANCIENT HISTORY. This course will give a comprehensive survey of the contributions which the nations of antiquity made to medieval and modern civilization and point out the real significance of ancient history in the development of human society. It is designed especially for teachers and will treat particularly the chief pedagogical problems of the subject and the leading sources of information; but the academic emphasis will in no way prevent the course from being of value to all who are interested in the development of civilization. *T. Th.*, 8.50. Mr. Barnes.

XXIV. 2. CHINESE HISTORY. A survey of the historical development of China as an explanation of its recent history. The course will include a discussion of the Boxer Rebellion, the establishment of the Republic, and present problems. *M. F.*, 2 p.m. Mr. Wang (Professor, Peking University).

POLITICAL SCIENCE

IX. 2. POLITICAL SCIENCE. A study of the state and of the leading modern constitutions. Recitations and discussions and constant comparisons with the American Constitution. Open to juniors and seniors. *T. Th.*, 8, room 405. Instructor Carman.

XIV. 2. INTERNATIONAL LAW AND DIPLOMACY. Open to juniors and seniors. *T. Th.*, 8, room 310. Instructor Carman.

Not given in 1916-1917.

XXII. 3. AMERICAN GOVERNMENT. First semester, a study of the national government, including political parties. Second semester, a study of state and local government with special emphasis on township, county and city. Open to juniors and seniors. *T. Th. S.*, II. Library. Instructor Carman.

XVII. 2. AMERICAN CONSTITUTIONAL DEVELOPMENT. For graduates only. Professor Mace. Hours to be arranged.

SOCIOLOGY

PROFESSORS PARSONS AND ROMAN.

Courses IX-X, and XVII are designed for graduates. All other courses may be taken by graduate and undergraduate students.

THEORETICAL AND HISTORICAL

II. 3. SOCIAL EVOLUTION. A general course in social evolution devoted to tracing the development of the chief forms of social organization from their origin to their present status. Topics: the origin and antiquity of man; an examination of the characteristics and duration of the pre-historic periods from the standpoint of cultural progress and the development of social organization; the development of the fundamental forms of social organization; the characteristics and contributions of the three great stages of civilization and the part which the great historic nations have taken in this process. Text-books, lectures, and readings. *M. W.*, 10. Instructor Barnes. Required of all major students in Sociology.

VII. (a) 2. SEMINAR. Research and thesis work. *W.*, 2-4. Seminar room. Professor Parsons, Instructor Barnes.

Open to graduate and senior major students only.

IX. 2. HISTORICAL DEVELOPMENT OF SOCIAL THEORY FROM PLATO TO COMTE.—I. Hours to be arranged. Instructor Barnes. Open to graduates and seniors by special permission.

X. 2. CONTEMPORARY SOCIOLOGICAL SYSTEMS. This course will bring IX down to the present. It will present the chief contributions of the following schools of Sociological thought and method: the biological-organic; the ethnographic; the psychological; the historical; and the Statistical.—II. Entrance conditions the same as IX. Instructor Barnes.

XIII. 3. THE PRINCIPLES OF SOCIOLOGY. A comprehensive survey of the chief psychological foundations of sociology. The mind is treated from the standpoint of its organizing and communicating function in social groups. Topics considered are: (1) the genesis of social consciousness in the family, gang, school, club, community and nation; (2) the social character of instinct, feeling, perception and thought; (3) the interpretation of the crowd, mob, fashion and custom; (4) the public will, democracy and leadership. Required of all major students in sociology. Prerequisite, Sociology I.—I. *M. W. F.*, 8.50. Professor Roman.

XIV. 2. THE HISTORICAL DEVELOPMENT OF THE FAMILY. A study of the development of the family from the earliest times to the present, and the chief forms of the family among the world's peoples. Allied institutions such as inheritance and the position of woman will be analyzed. *T. Th.*, 8.50. Instructors Barnes and Lord.

XVII. 2. ADVANCED SOCIOLOGICAL THEORY. This course will deal with the more difficult problems of social organizations and social evolution. Open to graduate students and specially qualified seniors. Given in alternate years with Sociology IX-X. Hours to be arranged. Instructor Barnes.

PHILANTHROPIC

III. 2. GENERAL INTRODUCTION TO MODERN PHILANTHROPY. This course will introduce the student to the causes and nature of the most important modern social problems, and the history and analysis of the different methods of relief which have been adopted. Emphasis will be laid upon the problems of child welfare and their solution. *Sec. A., T. Th., 10; Sec. B., T. Th., 12.* Professor Parsons.

IV. 2. DEGENERATE SOCIAL CLASSES. Text-book and lecture course on defectives, dependents, and delinquents, including visits to institutions for the care and custody of these classes.—I. *T. Th., 11.* Professor Parsons.

V. 2. STATISTICS AND SOCIOLOGY. Lectures, recitations, readings, and laboratory work. This course is designed to train the student to interpret statistics of modern social conditions with a view to the discovery of causes. The student will be introduced to the study of method in statistical tabulation and will be required to select and work out some definite statistical problem.—I. *T. Th., 11.* Professor Parsons, Instructor Barnes.

VI. 2. THE SOCIOLOGICAL ASPECTS OF RELIGION. A comprehensive survey of the effect which religion has had upon social life. The form and theory of religion will be studied only far enough to make clear its social effects. The course will conclude with a study of the place of religion in modern social life. *Sec. A., M. W., 11; Sec. B., M. W., 12.* Professor Parsons.

VIII. 2. CRIMINOLOGY. A theoretical study of the causes of crime and a discussion of remedies and prevention. Lectures, readings and discussions.—II. *T. Th., 11.* Professor Parsons. Senior major students entering this course must have had Sociology IV.

XI. 2. RURAL SOCIAL CONDITIONS. A study of rural social conditions and the agencies for improving them, including conditions of home life; dwellings; water supply; sanitation; facilities for communication and social intercourse; village social centers; the movement of population toward the cities; rural schools and churches as centers of social and educational activities; farmers' reading circles, institutes and other social organizations.—II. Supplementary to sociology XVIII. *M. W., 8.50.* Instructors Barnes and Lord.

XII. 2. TRAINING CLASS FOR SOCIAL WORKERS. This course is arranged to give instruction and experience to mature students along

the following practical lines; settlement work; methods of organization and raising funds for social work; secretarial work; friendly visiting among the poor; neighborhood work; case work for associated charities; religious social service; child welfare; probation.—I and II. Hours to be arranged. Professor Parsons.

XV. 2. SOCIAL LEGISLATION IN ITS RELATION TO SOCIAL PROGRESS.—I. Professor Parsons. Not given in 1916-1917.

XVI. 2. DIVORCE AND MODERN FAMILY PROBLEMS.—II. Professor Parsons. Not given in 1916-1917.

XVIII. 2. URBAN SOCIAL PROBLEMS. A study of problems connected with city life; growth of cities in recent times; social and moral conditions in cities; and plans for reform such as municipal ownership; the commission form of government; civic improvement; and the extension of rapid transit facilities.—I. *M. W.*, 8.50. Mr. Barnes, Instructor Lord.

ECONOMICS

PROFESSOR ROMAN

III. 3. MONEY, CREDIT AND BANKING. The nature and functions of money; development of money in the United States; credit and credit currency; types of banking systems; handling checks; drafts and exchanges; the Federal Reserve Act.—I. *M. W. F.*, 10. Professor Roman.

IV. 3. PUBLIC FINANCE AND TAXATION. Public expenditures; budget systems; public revenue from public domains and industries. Taxation systems; tax reforms and special forms of taxation.—II. *M. W. F.*, 10. Professor Roman.

V. 3. TRUSTS. Economic and financial problems connected with the organization and management of modern corporations. Legal aspects. Financial plan and flotation of the company's securities. Regulation or control by state or federal authority.—I. *T. Th. S.*, 8.50. Professor Roman.

XXII. 3. COMMERCIAL GEOGRAPHY AND TRANSPORTATION. Early problems in U. S. public road building. The epoch of canals. Growth of railroads. An analysis of railroad reports, theory of rate making, and the powers of the Interstate Commerce Commission with reference to discriminations, rates and pooling. The development of trade with South America.—II. *T. Th. S.*, 8.50. Professor Roman.

VI. 3. SOCIALISM. In this course, it is the purpose to make a critical study (1) of the writings of leading exponents of Socialism, with a view to testing socialistic theories for reconstructing society; and (2) of certain proposed reforms, or partial modifications of existing institutions. Prerequisite: Principles of Sociology.—II. *M. W. F.*, 8. Professor Roman.

VII. 3. LABOR PROBLEMS. The laboring classes before the nineteenth century; development of trade-unionism in England and America; strikes; collective bargaining and trade agreements; arbitration; machinery and division of labor; unemployment; labor legislation; immigration; profit-sharing; cooperation; the trend of wages; labor politics and labor parties in America and other countries.—I. *T. Th. S.*, 8. Professor Roman.

VIII. 3. INDUSTRIAL EDUCATION. A study of the widespread movement for industrial education and its relation to vocational guidance. An historical sketch of industrial and commercial education in the United States and Germany. An analysis of the attitude of the manufacturer, of organized labor, of the educator, and of the social worker. A study of existing types of industrial schools in the United States and Germany. The lessening of poverty and crime through industrial training.—II. *T. Th. S.*, 8. Professor Roman.

XV. 3. ACCOUNTING. The subjects treated will be (1) forms of accounts, (2) mode of handling commercial papers, (3) the recording of transactions, (4) double-entry methods in retail business, (5) the use of the income account and balance sheet in connection with the capitalization and valuation of property, and (6) the relation of cost accounts to business and industrial efficiency.—I. *M. W. F.*, 8.

XVI. 3. ACCOUNTING PROBLEMS. The problems taken up will vary from year to year. The following is the field from which the topics will be chosen: Wholesale partnership accounting, Corporation Accounting, Cost Accounting, and Banking Accounting.—II. *M. W. F.*, 8.

XVII. 3. CORPORATION FINANCE. An exposition of the methods of promoting, organizing and financing corporations is followed by an analytical study of corporation accounting, reports of operation, methods of capitalization, reorganization, conversions of securities, rights of investors, valuation of stocks and bonds, and the industrial efficiency of the corporate form of organization. Each student is expected to make a careful study of some incorporated industry, and report thereon to the class.—I. *M. W. F.*, 11.

XVIII. 2. PROPERTY INSURANCE. Principles of fire insurance, marine insurance, title insurance, credit insurance.—I. *T. Th.*, 8.

XIX. 2. LIFE INSURANCE. Principles of life insurance, forms of policies, investment of funds, state and national legislation, social betterment achieved by insurance.—II. *T. Th.*, 8.

XX. SEMINAR. Required of juniors who select Economics as a major. Professor Flick and Associate Professor Tanner of the Department of History will direct the investigations. *W.*, 4-6 p.m.

XXI. SEMINAR. Required of all seniors who select Economics as a major. *W.*, 4-6 p.m. Professor Roman.

PHILOSOPHY

PROFESSORS WILSON AND PENNEY

Courses XI, XII, XIII, XIV, XV, XVI, XVII may count for graduate work.

XVI. 3. EXPERIMENTAL PSYCHOLOGY. An elementary laboratory course intended to acquaint the student with the methods and results of the science. Definite and accurate experimental work is required of each student.—II. *M. W. F., 10, room 203.* Professor Penney. Presupposes course II.

XVII. 3. METAPHYSICS. A continuation of V. In this course the outstanding theories of reality are examined. The aim is to help the student to develop for himself the main features of a rational world-view.—II. *M. W. F., 8.50, room 204.* Professor Wilson. Required of majors in Philosophy.

IX. 3. THE CRITICAL PHILOSOPHY OF KANT. A study of Kant's three Critiques, with special reference to their significance for the solution of present-day problems. *Th., 2.30-5 p.m. Seminar room.* Professor Wilson. Required of majors in Philosophy.

X. 3. CURRENT THOUGHT—ENGLISH AND AMERICAN. An intensive study of representative men, such as Bradley, Bosanquet, Ward, Russell, Royce, and James. The choice varies from year to year. *T., 2.30-5 p.m. Seminar room.* Professor Wilson. Primarily for graduates.

XI. 3. CURRENT THOUGHT—FRENCH AND GERMAN. A study of Bergson and Eucken. *T., 2.30-5. Seminar room.* Professor Wilson. Primarily for graduates. Alternates with X.

XII. 3. THEISM. A critical study of recent theistic and anti-theistic types of thought. Hours to be arranged. Professor Wilson. Primarily for graduates.

XIII. 3. PROBLEMS IN THE PHILOSOPHY OF RELIGION. Hours to be arranged. Professor Wilson. Primarily for graduates. Alternates with XII.

XIV. 3. READINGS IN THE PHILOSOPHICAL CLASSICS. The first semester covers the more important Dialogues of Plato and the Ethics and Metaphysics of Aristotle. The second semester is devoted to a study of early Rationalism and the writings of Descartes, Spinoza and Leibnitz. *W., 3 p.m. Seminar room.* Professor Penney. Primarily for graduates.

XV. 3. ADVANCED COURSE IN ETHICS. A study of recent ethical theory as developed in Green, Spencer, Sidgwick and Martineau. Hours to be arranged. When given, this course replaces X or XI. Professor Wilson. Primarily for graduates.

GROUP III

MATHEMATICS

PROFESSORS METZLER, ROE AND BULLARD

For graduate work courses III to VII and XXVII may count on a minor. Courses VIII to XXV may count on a major.

III. 4. ANALYTIC GEOMETRY.

IV. 1. ALGEBRA. *W.*, 10, room 404. Associate Professor Decker. Open to those who have completed Mathematics I and II.

V. 3. CALCULUS. *T. Th. S.*, 11, room 304. Professor Metzler and Assistant Professor Lindsey. Open to those who have completed course III.

VI. (a) 1. DETERMINANTS.—I.

(b) 1. ANALYTICAL TRIGONOMETRY.—II. *W.*, 8.50, room 109. Professor Roe.

Open to those who have completed or are taking course III and IV.

VII. 2. THEORY OF EQUATIONS. *M. F.*, 8.50, room 109. Professor Roe. Open to those who have completed or are taking course III.

VIII. 3. ADVANCED CALCULUS.—I. *M. W. F.*, 10, room 304. Professor Roe.

IX. 3. DIFFERENTIAL EQUATIONS.—II. *M. W. F.*, 10, room 304. Professor Roe. Open to those who have completed course VIII.

X. 3. ANALYTICAL GEOMETRY OF TWO AND THREE DIMENSIONS.—I. *T. Th. S.*, 10, room 304. Professor Metzler. Open to those who have completed course III.

XI. 3. MODERN GEOMETRY.—II. *T. Th. S.*, 10, room 304. Professor Metzler. Open to those who have completed course III.

XII. 3. ANALYTICAL MECHANICS. *M. W. F.*, 11, room 304. Professor Roe.

Open to those who have completed course V. See Physics XII.

XV. 3. TEACHERS COURSE.—I. *M. W. F.*, 8.50, room 304. Professor Metzler.

This course is intended for those who expect to teach mathematics.

XXVI. 1. SPHERICAL TRIGONOMETRY.—II. *M.*, 4, room 304. Professor Roe. Open to those who have completed I and II.

XXVII. 3. ANALYTICAL GEOMETRY AND CALCULUS. This course is intended for those who would like some knowledge of Analytical Geometry and Calculus but who cannot give the time necessary for the regular courses in these subjects. *T. Th. S.*, 8.50. Associate Professor Decker.

Open to those who have completed Mathematics I and II.

XXVIII. 3. SOLID GEOMETRY.—II. *M. W. F.*, 10, room 404. Associate Professor Decker. Open to those who have completed I and II.

XXIX. 3. ANALYTIC MECHANICS.—I. *T. Th. S.*, 11, room 404. Associate Professor Decker.

A brief course open by special permission to certain qualified students who are not prepared to take Mathematics XII.

XIII. 3. NEWTONIAN POTENTIAL FUNCTION.—I. Professor Roe.

Open to those who have completed courses VIII and XII.

XIV. 3. SPHERICAL HARMONICS.—II. Professor Roe.

Open to those who have completed courses VI and XIII.

XVI. 3. (a) PROJECTIVE GEOMETRY; (b) HIGHER PLANE CURVES. *M. W. F.*, 8.50, room 104. Professor Bullard.

XVII. 3. TWISTED CURVES, GENERAL THEORY OF SURFACES. *M.*, 11, *T.*, 8.50, *F.*, 3, room 411. Professor Bullard.

XVIII. 3. SYMMETRIC FUNCTIONS. *T. Th. S.*, 11, room 411. Professor Roe.

XIX. 3. ELLIPTIC INTEGRALS AND ELLIPTIC FUNCTIONS.—I. *T. Th. S.*, 8.50, room 411. Professor Metzler.

XX. 3. GENERAL THEORY OF FUNCTIONS OF A COMPLEX VARIABLE.—II. *T. Th. S.*, 8.50. Professor Metzler.

XXI. 3. WEIERSTRASS' THEORY OF FUNCTIONS. *M. W. F.*, 10. Professor Metzler.

XXII. 3. THEORY OF INVARIANTS. *T. Th. S.*, 11, room 413. Professor Roe.

XXIII. 3. THEORY OF SUBSTITUTIONS. Professor Roe.

XXIV. 3. DIFFERENTIAL GEOMETRY. *M. W. F.*, 11. Professor Bullard.

XXV. 3. SEMINAR. Professors Metzler, Roe and Bullard.

ASTRONOMY

PROFESSOR PECK

Course IV is designed exclusively for graduates. Other Graduate courses will be arranged on demand.

III. 2. SPHERICAL AND PRACTICAL ASTRONOMY. Intended primarily for students in Civil Engineering, but may be elected by students in the general courses, provided such election does not interfere with the work of the technical students. Graduate students will be allowed to carry on advanced work on furnishing evidence of having completed the requisite preliminary work in Trigonometry and elementary Calculus. *Observatory.*

IV. 3. THEORETICAL ASTRONOMY. Intended primarily for graduate students, but may be elected by undergraduates who have completed the requisite amount of Trigonometry and Calculus. The text used is

Bauschinger's *Die Bahnbestimmung der Himmelskörper*. Opportunity will be afforded for practice in the reduction of observations of comets and minor planets, together with the computation of the orbit of a comet moving in a parabola.

PHYSICS

PROFESSORS TATNALL, PORTER AND CLARK, ASSOCIATE PROFESSOR HARVEY

Courses V, VI, VII, VIII, IX, X, XI, XII, XIII, XVI, XVIII and XIX may be taken by undergraduate and graduate students.

Courses VII to XIX, inclusive, (except XV) will be given in accordance with the needs of graduates and advanced undergraduates. Not all of them are offered in any one year.

V. 3. ELECTRICITY AND MAGNETISM. Two class hours and one laboratory period. Intended for undergraduate majors in Physics. Prerequisite: Physics II and Calculus. Associate Professor Harvey.

VI. 4. ELECTRICAL MEASUREMENTS. Two lectures; two laboratory periods. Measurement of resistance, electromotive force and current, and calibration of instruments.—I. Measurement of capacity, inductance and permeability, and photometric tests.—II. Prerequisite: Physics III or V and Calculus. Professor Porter.

VII. 3. HEAT. An advanced course with laboratory work, covering high temperature measurements, radiation, thermodynamics, etc. Prerequisite: Physics V.

VIII. 3. ELECTRICITY AND MAGNETISM. An advanced course in the mathematical theory of this subject. Prerequisite: Physics V.

IX. 3. THEORY OF LIGHT. An advanced mathematical course. Prerequisite: Physics II and III and Calculus, or Physics V.

X. 3. MODERN PHYSICAL THEORIES. An advanced course with laboratory work, covering kinetic theory of gases, radioactivity and other recent advances in Physics. Prerequisite: Physics V.

XI. RESEARCH. Opportunity is given to graduate students, or to undergraduates of unusual ability to undertake original investigation. The department possesses excellent facilities for such work.

XII. 3. ANALYTICAL MECHANICS. See Mathematics XII.

XIII. 1. PRECISION OF MEASUREMENTS. An application of the theory of errors to laboratory work.

XVI. 1 OR 2. ADVANCED LABORATORY MEASUREMENTS. Prerequisite: Physics V.

XVIII. 1. HEAT CONDUCTION. An advanced course, dealing with applications of Fourier's series and with the differential equations of flow of heat.

XIX. 1. HYDRODYNAMICS. The elementary theory of fluid motion. An introduction to mathematical physics.

CHEMISTRY

PROFESSORS PATTEE, COOPER, BOEHNER, ASSOCIATE PROFESSORS JOHLIN, BREWER

Courses II, IV, V, XIV, XXIV are for undergraduates but may be offered as a graduate minor.

In like manner the remaining courses in the department may be offered as graduate major work.

II. 3. GENERAL INORGANIC CHEMISTRY. A more advanced course of inorganic chemistry consisting of lectures, recitations and laboratory work. Supplementary reading in the history of Chemistry is required. *W. F., 8.50; W. or Th., 2-4 p.m.* Professor Cooper.

IV. 3. QUANTITATIVE ANALYSIS. A laboratory course embracing the fundamental methods of gravimetric and volumetric analysis, consisting of one lecture period and 4 hours of laboratory weekly. *M., 8.50; M. T., 2-4 p.m.* Assistant Professor Grose. In case of conflict, by special arrangement a student may substitute 2 hours work on Thursday for one of the above afternoons.

Quantitative laboratory will be open for work, *M. T., 1.30-6 p.m.* and *Th., 8 a.m.-6 p.m.*

Laboratory will be closed at all other times.

Open to students who have taken III (a).

V. 3. ORGANIC CHEMISTRY. A course of lectures and recitations, together with laboratory work, on the preparation of organic compounds. *M. and W. or F., II; F., 2-4 p.m.* Professor Bochner.

Open to students who have taken or are taking course III (a) or III (b).

VII. 2. ELECTRO-CHEMISTRY. A laboratory course consisting of selected experiments illustrating fundamental principles, such experiments as measurement of current strength by means of coulometers, determination of transfer numbers, electro-motive force of concentration cells, etc., will be carried out.—II. Assistant Professor Grose.

Primarily for graduates but open to seniors who have taken courses X and XXI.

VIII. 2. INORGANIC PREPARATIONS. A laboratory course, in the preparation of a variety of inorganic compounds, introducing the student to the typical operations of the inorganic laboratory and emphasizing the industrial applications. The work of the second semester will include high temperature production and measurement and other methods of applied physical chemistry.—I or II or both. *W., II,* and five other periods at the student's option. Professor Cooper.

Open to graduate students who have taken courses IV and V and have a good reading knowledge of scientific German, and to seniors by special permission.

IX. 3. ORGANIC PREPARATIONS. A laboratory course in the preparation and characteristic reactions of a series of typical organic compounds. *W. F.*, 2-5 p.m. Professor Boehner.

Open to students who have taken course V.

X. 3. PHYSICAL CHEMISTRY. Introductory course designed especially for junior majors in Chemistry. Open to students who have taken or are taking Chemistry V and have taken Physics I or its equivalent. Recitations *W. F.*, 10. Laboratory *M.*, 2-5. Professor Cooper.

XI. 2. HISTORY OF CHEMISTRY. Open to students who have taken courses II and V. Professor Pattee.

XII. 2. ADVANCED PHYSICAL CHEMISTRY. Lectures, readings and conferences of a grade corresponding to the Ramsay Series of textbooks. Many practical applications will be considered. Professor Cooper.

Given in alternate years with course XXII on request of two students. Prerequisites: course X and a knowledge of Calculus.

Course VIII may well be taken with this course.

Open to students who have taken courses II, III, V and X.

XIV. 3. INDUSTRIAL CHEMISTRY. Lectures, recitations and collateral reading. A study of types of chemical machines, from the standpoint of design, application, efficiency and cost, together with an analysis of the variable factors in the operation of each machine. Chemical patents, industrial research, industrial books and magazines, meters, tools, etc. The object of the course is to acquaint the student with the general problems of the industrial chemist without reference to any special industry. Trips will be made to study installations of chemical machinery. Assistant Professor Hill.

Open to seniors and graduates who have taken Course II and IIIa and Physics III.

XV. 3. ADVANCED QUANTITATIVE ANALYSIS. Lectures and laboratory work. Methods of exact analysis will be considered, and analyses of silicates, iron and steel carried out.—I. *T.*, 8.50; *Th.*, 8-12. Assistant Professor Grose.

Students must be able to work in the laboratory at the assigned time. Supplementary work may be done in any of the periods when the laboratory is open. (See Course IV).

Open to students who have taken course IV.

XVI. 3. GAS AND FUEL ANALYSIS. One hour lecture, four hours laboratory. The complete analyses of chimney, illuminating and natural gases are carried out according to the methods of Hempel, Orsat and others. The properties and uses of various fuels are studied and samples are analyzed in the laboratory.—II. *T.*, 8.50; *Th.*, 8-12. Assistant Professor Grose.

Open to students who have taken course IV.

XVIII. 3. ADVANCED ORGANIC CHEMISTRY. A course of lectures and recitations on organic chemistry. *M. W. F.*, 12. Professor Boehner.

Open to students who have taken courses II and V.

XX. 2. WATER ANALYSIS. A course in the examination of waters as to their fitness for domestic use, for steam boilers, etc.—II. *S.*, 10, *T.*, *p.m.* Professor Pattee.

Open to students who have taken or are taking course IV.

XXI. 2. ELECTRO-CHEMISTRY. Two lectures weekly embracing such subjects as production of electric energy by chemical processes, application of thermo-dynamics to electro-chemistry, voltaic and storage cells, potential differences, polarization, technical electro-chemical processes.—I. Assistant Professor Grose.

Primarily for graduate students, but open to seniors who have taken course X.

XXII. 2. ADVANCED PHYSICAL CHEMISTRY. Given in alternate years with course XII (which see).—II. Professor Cooper. A knowledge of Calculus is desirable.

XXIII. 1. PHYSICO-CHEMICAL ANALYSIS. Lectures and studies in recent literature. Professor Cooper.

Open to graduate students who have taken course X.

XXIV. 3. AGRICULTURAL ANALYSIS. This course consists of a series of experiments which illustrate the fundamental principles of gravimetric and volumetric analysis. This is followed by the analysis of soils, fertilizers, milk, butter and foodstuffs, such as grain and fodder. Professor Pattee. *W.*, 11; *M. T.*, 2-4 *p.m.*

Open to students who have taken courses IIIb or IV.

XXVIII. 3. ORGANIC CHEMISTRY. A series of lectures and recitations on special topics, e.g., the carbohydrates, terpenes, etc. Open to students who have taken Chemistry XVIII. Professor Boehner.

XXIX. 3. TECHNICAL ORGANIC ANALYSIS. Open to students who have had Chemistry IV and V. Professor Boehner.

XXX. 3. ADVANCED INORGANIC CHEMISTRY. A course dealing with the rarer elements and compounds and with recent theories of Inorganic Chemistry. Assistant Professor Hill.

Open to students who have taken courses II, IV and V.

Not given in 1916-1917.

XXXI. 3. ADVANCED QUALITATIVE ANALYSIS. Lectures and laboratory work covering the principal reactions of some of the less common elements not considered in Chemistry IIIa and their qualitative detection and separation when present with the common elements. Associate Professor Johlin.

Open to students who have taken courses IIIa and IV.

RESEARCH WORK. Students who are sufficiently prepared will be

assigned a problem for original investigation occupying one or more semesters. Problems will be assigned by the department after conference with the students.

Required of candidates for B. S. in Chemistry and the graduate degrees in Chemistry. See Graduate Department.

SEMINAR I. Critical study of some special line of work under the direction of an instructor. Topic to be selected. Open to graduate students and by special permission, to seniors.

Journal Meetings. The instructors and graduate students meet weekly (*W.*, 4.30 p.m.) for the discussion of new contributions to Chemistry.

The Chemical Club affords opportunities for the discussion of current topics of chemical research and for hearing lectures by specialists in various chemical lines.

The meetings of the Syracuse Section of the American Chemical Society are open to the students in this department.

ZOOLOGY

PROFESSORS HARGITT AND SMALLWOOD, ASSOCIATE PROFESSOR HARGITT

Courses II, IV, XIII, XV, XVII, XVIII and XXII may be taken by undergraduate and graduate students. Courses XXXI-XXXVIII are strictly graduate courses.

Facilities are available for a considerable variety of advanced and graduate research in problems of Morphology, Embryology and experimental Zoölogy. Supplementing these in a most effective way, there are available at the Marine Biological Laboratory university tables open to those qualified to occupy them to advantage.

Graduate and undergraduate seminars and the zoölogical club afford opportunity for insight into current problems of biology.

II. (a) 2. HISTORICAL BIOLOGY. A course of lectures amply illustrated, reviewing the progress of biology from the time of Aristotle to the present. Hours to be arranged. Professor Hargitt.

II. (b) 2. PHILOSOPHICAL BIOLOGY. A study of the doctrines of evolution, e.g., Darwinism, Mutation, Heredity, Mendelism, etc., and their relations to current thought.—II. Hours to be arranged. Professor Hargitt.

IV. 2. PROTOBIOLOGY. This course will comprise studies in the biology of the micro-organisms, their life histories, taxonomy, relations to various phases of organic life, disease, etc., and may be most profitably taken as a continuation of courses in bacteriology. Associate Professor Hargitt.

XIII. 4. NEUROLOGY. This course traces the development of the nervous system in animals. Training in neurological technique is an

important feature of the work.—I. Hours to be arranged. Professor Smallwood.

XV. 4. EMBRYOLOGY. A course comprising lectures, demonstrations and laboratory work upon the fundamentals of vertebrate development, including problems of phylogeny, heredity, etc. The types studied, aside from incidental features of oogenesis, fertilization, etc., are *Amphioxus*, frog, chick and a mammal.—II. Professor Hargitt. Hours as in XIV.

XVII. TAXONOMY. Courses devoted to the critical systematic study of selected groups of animals, and including also problems of geographic distribution, influences of environment, ecology, etc. Given in alternate years. Members of staff.

XVIII. 2. SEMINAR. A course devoted to methods of research, reviews of current biological literature, etc. Open, by special permission, to major students in Zoölogy during the senior year. Hours to be arranged. Professor Hargitt.

XXII. 4. GENERAL PHYSIOLOGY. Lectures and laboratory studies upon the principles of general physiology, with special reference to the physiology of the cell. Hours to be arranged. Instructor Day.

XXXI. COMPARATIVE MORPHOLOGY OF INVERTEBRATES. Devoted to problems of structure and development in relation to phylogeny. Professor Hargitt.

XXXII. COMPARATIVE ANATOMY OF VERTEBRATES. Similar in method and aims to the preceding. Professor Smallwood.

XXXIII. COMPARATIVE PHYSIOLOGY OF THE SENSE ORGANS. A course treating of the functions of the sense organs from the evolutionary standpoint. Instructor Day.

XXXIV. COMPARATIVE HISTOLOGY. A comparative study of the microscopic structure of tissues and organs of animals, chiefly the lower vertebrates and the invertebrates. A study of the changes involved in the transformation of embryonic tissues into those of the adult will be included. Time and hours to be arranged. Associate Professor Hargitt. Prerequisite: Zoölogy XIV.

XXXV. CYTOLOGY. By reading and lectures will be presented the present status of our knowledge of the minute and detailed structure of the cell, and especially of the cell nucleus. The significance of these facts in relation to problems of heredity, cell physiology and sex will be considered. The laboratory work will consist of studies in histogenesis, oogenesis and spermatogenesis.—II. Hours to be arranged. Associate Professor Hargitt. Prerequisites: Zoölogy XIV and XV.

XXXVI. ANIMAL BEHAVIOR. A course devoted to the behavior of organisms under varying conditions, effects of stimuli, tropisms, physiological states, etc. Professor Hargitt.

XXXVII. RESEARCH. Various problems of research will be assigned to students prepared to engage therein, as conditions may warrant. Professor Hargitt and Staff.

XXXVIII. SEMINAR. Weekly conferences upon assigned topics of investigations, reviews of current literature, thesis problems, etc. Professor Hargitt.

BACTERIOLOGY

ASSISTANT PROFESSOR JONES

VIII. RESEARCH WORK. Students with adequate training and ability who may desire to undertake researches will be given all the assistance and facilities that the department commands.

BOTANY

PROFESSOR BRAY, ASSISTANT PROFESSOR MEIER

Courses XII, XIII, XIV, XVI and XXXI are primarily undergraduate but may under some conditions count as graduate.

Courses XVII, XVIII and XIX are primarily for graduate students. Elections of courses beyond X and XI should be made in conference with the head of the department.

XII. 3 OR 4. PLANT ANATOMY. The tissues of plants considered especially from the standpoint of function. Methods in plant histology, including the preparation of a series of microscopical slides for the study of plant tissues.—I. *T. Th., 8; W., 2-4 p.m.* and other hours by appointment.

Prerequisite: Botany XI or XVI.

XIII. 3 OR 4. PLANT PHYSIOLOGY. Lectures, conferences and experiments on the physiology of nutrition, growth, reproduction and the responsive behavior of plant organs to light, gravity, water and other factors of their environment. The practice in manipulation incident to performing the experiments required in this course is of special value to those who are preparing to teach Botany.—II. *T. Th., 8; W., 2-4 p.m.* and other hours by appointment.

Prerequisite: Botany XII.

XIV. 3. (a) BOTANICAL MICROTECHNIQUE. (b) SPECIAL MORPHOLOGY. Practice in histological methods followed by special study of the morphology of structures concerned in spore production, fecundation and embryology, material for the study of which is prepared by the student. Hours to be arranged.

Prerequisite: Botany X or XI.

XVI. 3 OR 4. TAXONOMY. Lectures on the genetic relationships, geographical distribution and economic uses of the families of flowering

plants. Field work in studies of the local flora, and in collecting, identifying and preparing museum specimens of native plants. The geographic ecology of the vegetation of the Syracuse region will be a feature of the field work in this course. *M. W.*, 8.50; *M.*, 2-4 p.m.

Prerequisite: Botany X or XI.

XVII. 3. RESEARCH. For graduate students and seniors of advanced botanical training. Special problems will be assigned in physiology, morphology or ecology or upon phyto-geographic questions connected with the vegetation of New York State. Special facilities for research work in ecology are offered.

XVIII. 1. BOTANICAL SEMINAR. Reviews of current botanical literature; reports on research work and discussions on the progress of Botany. Open to graduates in Botany and Zoölogy. Required of seniors majoring in Botany.

XIX. 3. ADVANCED ECOLOGY. The special purpose of this course is to apply the principles and methods of Ecology to the study of the diversified vegetation of New York State. Plant societies representing the successive stages in the development of the vegetation will be studied in the field. Lectures and colloquiums.

Open to graduates in all colleges in the University and to seniors of advanced botanical training.

XXXI. 3. ADVANCED PLANT PATHOLOGY. A discussion of the problems of plant pathology. Laboratory practice in cultivation and control of disease-producing organisms. Not given in 1916-1917.

Prerequisite: Botany XXX (a) and (b).

GEOLOGY

PROFESSOR HOPKINS, ASSOCIATE PROFESSOR SMITH

Courses III to IX and XV may be taken by graduate or undergraduate students.

Courses IX to XIII are primarily graduate, but may be elected by undergraduate students by permission.

III. 3. INTRODUCTION TO PALEONTOLOGY. Systematic study of invertebrate fossils. Lectures and laboratory work.—I. Associate Professor Smith.

IV. 3. HISTORICAL GEOLOGY. Lectures, library, laboratory and field work.—I.

Prerequisites: Geology II and III. Associate Professor Smith.

V. (a) 3. ECONOMIC GEOLOGY. Professor Hopkins.

V. (b) 3. INDUSTRIAL GEOGRAPHY OF THE UNITED STATES. The development and distributions of the industries based upon geographic and geologic conditions. Taken up by physiographic regions. *T. Th.*, 8, laboratory, *M.*, 2 p.m. Professor Hopkins.

V. (c) 3. GEOLOGY OF SOILS, WATER AND FERTILIZERS.—II. Origin, kinds and properties of soils. Principles of Hydrology and geology of natural fertilizers. Professor Hopkins, or Assistant Professor Clark.

VI. 2 OR 3. PHYSIOGRAPHY OF THE UNITED STATES.

Prerequisite: Geology I. *W. F.*, 8, laboratory, *Th.*, 2 p.m. Professor Hopkins and Assistant Professor Brainerd.

VIII. 3. PHYSIOGRAPHY AND GEOLOGY OF NEW YORK. Professor Hopkins.

Prerequisites: Geology I and II.

IX. 3. GENERAL GEOLOGY. Advanced course. Prerequisites: Geology I and II. Professor Hopkins.

X. SPECIAL GEOLOGY. Field work, laboratory and consultation. Largely individual work. Primarily for graduate students. Professor Hopkins.

XII. 1. GEOLOGICAL SEMINAR. Professor Hopkins, Associate Professor Smith, Assistant Professors Brainerd and Clark.

XIII. (a) 6. HISTORICAL GEOLOGY. For graduate students.—I. Associate Professor Smith.

XIII. (b) 6. PALEONTOLOGY. For graduate students.—I. Associate Professor Smith.

Prerequisites: Geology IV and Zoölogy XI.

XV. 3. ADVANCED PHYSIOGRAPHY. *T. Th.*, 12; *Th.*, 2-4 p.m. Professor Hopkins.

MINERALOGY

PROFESSOR RICHARDSON

Courses IV, V, VI and XI may be taken by undergraduate and graduate students.

Courses VII, VIII and X are for graduate students.

III. 3. APPLIED MINERALOGY. See College of Applied Science—II.

IV. 3. CHEMICAL MINERALOGY. An advanced course in the study of the ores of the precious metals, rock-forming silicates and hydrocarbon minerals. It embodies also a discussion of all classes of minerals and metallurgical products. *F.*, 11; *W.*, 2-5 p.m. Prerequisites: Mineralogy II and Chemistry I and III.

V. 3. CRYSTALLOGRAPHY. A study of the systems of crystallization through the aid of models and natural crystals, measurements of angles, projection of crystals, use of reflecting goniometer, preparation of microscopic slides and their study by polarized light. *Th.*, 10; *T.*, 2-5 p.m. Prerequisite: Mineralogy I or II.

VI. 3. PETROLOGY. A study of the chemical and mineralogical composition, classification, origin, mode of occurrence and distribution

of all types of rocks. *W. F.*, 8; *M.*, 2-4 p.m. Prerequisite: Mineralogy I or II.

VII. 3. PETROGRAPHY. Advanced work in the microscopic determination of minerals and rocks. Prerequisite: Mineralogy V.

VIII. 3. ASSAYING. A practical course in the determination of the gold, silver and lead values in ores by fire methods.

Prerequisites: Mineralogy II or III, and Chemistry III.

IX. 1. APPLIED MINERALOGY. See College of Applied Science.—I.

X. 3. RESEARCH MINERALOGY. Special field and laboratory problems for graduate students.

XI. (a) 3. ECONOMIC MINERALOGY. A study of the ores of the precious and useful metals, alkaline earths and alkalies, the quarry products and the carbon minerals, with reference to their origin, modes of occurrence, distribution, extraction and application to human arts and industries. *T. Th. S.*, II. Prerequisite: Geology II.

GROUP IV

MEDICAL SCIENCES

The courses given in various departments of the College of Medicine are open to graduate students in other Colleges of the University. A course in a department of the College of Medicine may be undertaken by such a graduate student if his previous experience is such that, in the opinion of the teacher in charge of the course, he is prepared to profit from undertaking it.

GROUP V

FINE ARTS

Graduate courses are given in Architecture, Painting and Music for those prepared to take them.

GROUP VI

MECHANICAL ENGINEERING

PROFESSOR ACHESON

M. X. ADVANCED DESIGN. Graduate work. Special work unlimited in scope, affording an intimate business study of shop processes, and the relation of the chosen designs thereto; the interchangeable system; jigs and fixtures; manufacturing in quantities; cost of production; materials of the market, etc.

Required—Graduate degree from an engineering college of repute.

SPECIAL PROBLEMS IN MECHANICAL ENGINEERING. Special problems demanding original investigation in advanced Mechanical Engineering.

The course will include conferences, laboratory tests, outside testing and design work, as required for the particular problem.

Required—Degree from an engineering college of repute.

ELECTRICAL ENGINEERING

PROFESSOR GRAHAM, ASSOCIATE PROFESSOR LAWTON

E. L. III. ELECTRICAL RESEARCH. For graduate students who show special aptitude in this line.

A. C. II. 2. ALTERNATING CURRENT ENGINEERING. Treatment as developed by Steinmetz in *Theoretical Elements of Electrical Engineering and Alternate Current Phenomena*; special attention to the application of method in practical problems of design and installation.

Required—E. M. I. and Math. IX.

A. C. III. 5. TRANSIENT CURRENTS. For graduate students. Theory of the disturbances accompanying abrupt changes in the constants of circuits, including the phenomena of light and power circuits, the propagation of signals along telegraph and telephone cables, and the effect of loading the latter.

Required—Math. IX. or its equivalent.

A. C. IV. 3. ELECTRO-MAGNETIC WAVES. For graduate students. Theory of electro-magnetic waves, including their use in signalling.

Required—Math. IX. or its equivalent.

GROUP VII

EDUCATION

PROFESSOR STREET, PROFESSOR HURST

Courses III, IV, VI and VII may be taken by undergraduates and graduates. Courses XXIII, XXIV, XXVII, XXIX and XXXI are for graduates only.

III. 4. HISTORY OF EDUCATION. Covers briefly ancient and modern education. Special attention is given to the movements of thought from Comenius to the present.—I. *T. Th. S.*, 8.50, 10. Professor Hurst.

IV. 2. PHILOSOPHY OF EDUCATION. Designed to aid the student in the formation of an "educational creed." It summarizes the different theories and ideals of education, and studies the general principles that underlie educational endeavor. It involves the reading and criticism of several books of reference.—II. *T. Th. S.*, 8.50, 10. Professor Hurst.

VI. 2. EDUCATIONAL PSYCHOLOGY. Concerns both the science and the art of education and aims to study the laws of the developing mind in their direct relation to teaching. It implies a fair knowledge of the general principles of Psychology and cannot be taken before the com-



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pletion of courses I and II of the department of Philosophy.—I. *W. F.*, 8.50, 10. Professor Street.

VII. 2. SCHOOL ORGANIZATION AND MANAGEMENT. Presents the practical problems of the schoolroom, such as organization, departments, courses of study, daily programs, appliances and furniture, school law, etc.—II. *M.*, 8.50, 10. Professor Street.

XXII. 3. COMPARATIVE PEDAGOGY. The National systems of education in England, France, Germany and America. Special attention is given to organization, administration and supervision; training of teachers; school curricula; methods of instruction, etc.—I. *T. Th. S.*, 8.50. Professor Street.

XXIII. 3. SCHOOL ADMINISTRATION AND SUPERVISION. This course is designed for students who wish to become supervisors or superintendents and deals with the various forms of educational administration; school buildings; apparatus; functions of the various school officers, relation of superintendents to board, principal, teachers, children, parents, community, etc.; school management; courses of study; and the various problems that concern the successful working of a school system.—II. *T. Th. S.*, 8.50. Professor Street.

XXVI. COMPARATIVE PSYCHOLOGY. A comparative study of the various human and animal psychical activities, designed to aid the student in the solution of certain educational problems growing out of these activities. Professor Hurst.

Given in alternate years.

XXX. SEMINAR AND RESEARCH. Professor Street and Professor Hurst.